

New PCT National Phase Application
Docket No. 32860-000306/US

What is claimed is: Patent claims

1. (Amended) A vacuum contactor, comprising:
~~having~~ a contactor housing; ~~(1);~~
- a drive coil ~~(2);~~
- an armature ~~(3);~~
- an operating element; ~~(4)~~ and
- at least one vacuum contact, wherein
—— ~~with the drive coil is adapted to (2) deflecting the armature (3) from an armature rest position (AR) to an armature operating position (AB) when a pull-in current (IA) is applied,~~
wherein
—— ~~with the deflection of the armature is adapted to (3) causing the operating element (4) to be deflected from an element rest position (ER) to an element operating position (EB),~~
and wherein
—— ~~with the deflection of the operating element (4) is adapted to resulting in closing of the at least one vacuum contact,~~
—— ~~with, wherein~~ when the armature (3) is deflected from the armature rest position (AR) to the armature operating position (AB), the armature (3) is adapted to first of all passing through an initial movement distance (sV), and is then adapted to then passing through a driving movement distance (sM),
—— ~~with the operating element (4) being deflected by the armature (3) only while the armature latter is passing through the driving movement distance (sM), and wherein~~
—— ~~with the operating element is adapted to (4) always either remaining in the element rest position (ER) or being deflected completely to the element operating position (EB) when a current that is less than the pull-in current (IA) is applied to the drive coil (2).~~

NEW CLAIMS

2. The vacuum contact as claimed in claim 1,
wherein the ratio of the initial movement distance to the driving movement distance is between 1:3 and 3:1.
3. The vacuum contactor as claimed in claim 1,
wherein the ratio of the initial movement distance to the driving movement distance is

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between 2:3 and 3:2.

4. The vacuum contactor as claimed in claim 1, wherein the armature is deflected by the drive coil against an initial movement force while it is passing through the initial movement distance, and against a driving force while it is passing through the driving movement distance, and wherein the initial movement force is less than the driving force.

5. The vacuum contactor as claimed in claim 4, wherein the ratio of the initial movement force to the driving force is between 1:10 and 1:2.

6. The vacuum contact as claimed in claim 4, wherein the ratio of the initial movement force to the driving force is between 1:5 and 1:4.

7. The vacuum contactor as claimed in claim 4, wherein the initial movement force is applied by an initial movement spring device, and the driving force is applied by a driving spring device, wherein the initial movement spring device is supported firstly on the armature and secondly on the operating element, and wherein the driving spring device is supported firstly on the operating element and secondly on the contactor housing.

8. The vacuum contactor as claimed in claim 1, wherein the operating element includes a stop, against which the armature is moved when it is deflected from the armature rest position.

9. The vacuum contactor as claimed in claim 2, wherein the armature is deflected by the drive coil against an initial movement force while it is passing through the initial movement distance, and against a driving force while it is passing through the driving movement distance, and wherein the initial movement force is less than the driving force.

10. The vacuum contactor as claimed in claim 9, wherein the ratio of the initial movement force to the driving force is between 1:10 and 1:2.

11. The vacuum contact as claimed in claim 9, wherein the ratio of the initial movement force to the driving force is between 1:5 and 1:4.

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12. The vacuum contactor as claimed in claim 3, wherein the armature is deflected by the drive coil against an initial movement force while it is passing through the initial movement distance, and against a driving force while it is passing through the driving movement distance, and wherein the initial movement force is less than the driving force.

13. The vacuum contactor as claimed in claim 12,
wherein the ratio of the initial movement force to the driving force is between 1:10 and 1:2.

14. The vacuum contact as claimed in claim 12,
wherein the ratio of the initial movement force to the driving force is between 1:5 and 1:4.

15. The vacuum contactor as claimed in claim 5,
wherein the initial movement force is applied by an initial movement spring device, and the driving force is applied by a driving spring device, wherein the initial movement spring device is supported firstly on the armature and secondly on the operating element, and wherein the driving spring device is supported firstly on the operating element and secondly on the contactor housing.

16. The vacuum contactor as claimed in claim 6,
wherein the initial movement force is applied by an initial movement spring device, and the driving force is applied by a driving spring device, wherein the initial movement spring device is supported firstly on the armature and secondly on the operating element, and wherein the driving spring device is supported firstly on the operating element and secondly on the contactor housing.

17. The vacuum contactor as claimed in claim 2,
wherein the operating element includes a stop, against which the armature is moved when it is deflected from the armature rest position.

~~18. The vacuum contactor as claimed in claim 3,
wherein the operating element includes a stop, against which the armature is moved when it is deflected from the armature rest position.~~

198. The vacuum contactor as claimed in claim 4,
wherein the operating element includes a stop, against which the armature is moved when it

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is deflected from the armature rest position.

19. A method of operating a vacuum contactor including a drive coil, an armature, an operating element, and at least one vacuum contact, comprising:

applying a pull-in current to the drive coil to deflect the armature from an armature rest position to an armature operating position;

causing, from the deflection of the armature, the operating element to be deflected from an element rest position to an element operating position;

causing, from the deflection of the operating element, closing of the at least one vacuum contact; and

causing, when the armature is deflected from the armature rest position to the armature operating position, the armature to first pass through an initial movement distance and then pass through a driving movement distance, with the operating element being deflected by the armature only while the armature is passing through the driving movement distance, and wherein the operating element is adapted to always either remain in the element rest position or be deflected completely to the element operating position when a current that is less than the pull-in current is applied to the drive coil.

20. An apparatus, comprising:

a vacuum contactor including a drive coil, an armature, an operating element, and at least one vacuum contact; and

means for applying a pull-in current to the drive coil to deflect the armature from an armature rest position to an armature operating position, wherein, from the deflection of the armature, the operating element is adapted to be deflected from an element rest position to an element operating position, wherein, from the deflection of the operating element, the at least one vacuum contact is adapted to be closed, wherein, when the armature is deflected from the armature rest position to the armature operating position, the armature is adapted to first pass through an initial movement distance and then pass through a driving movement distance, with the operating element being deflected by the armature only while the armature is passing through the driving movement distance, and wherein the operating element is adapted to always either remain in the element rest position or be deflected completely to the element operating position when a current that is less than the pull-in current is applied to the drive coil.